Mechanical and thermal properties of kenaf reinforced thermoplastic polyurethane (TPU)-natural rubber (NR) composites

ABSTRCT

In this paper, natural rubber (NR) was mixed with thermoplastic polyurethane (TPU) and kenaf as fillerreinforcement for the polymer composite. Mixing the material using the internal mixer and hot press machine was able toblend the material homogeneously. Investigation of the new polymer composite characterisation was carried out by thermalgravimetric analysis (TGA), along with tensile, flexural and impact tests. The TGA for the polymer composite achieved322ºC before degradation and increase in tensile and impact strength with the increase of TPU in the polymer compositematrices were observed. The result indicated an improvement in tensile, flexural and impact strength for the kenaf filledTPU-NR composites. The mixing of kenaf fibre and TPU-NR polymer showed degradation that was gradually diminishingturned into ashes. TGA result showed all compositions of kenaf filled TPU-NR composites samples shared the same peaktemperature, being degraded at 600ºC.

Keyword: Kenaf; Natural rubber; Thermoplastic polyurethane; Hybrid polymer composite; Green composites.